User's Guide

Common Gateway Services CSCI

Checkout and Launch Control System (CLCS)

84K07512-001

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NOTE: See "**Supporting Document Note**" on following page

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Supporting Document Note: Acronyms and definitions of many common CLCS terms may be found in the following documents: CLCS Acronyms 84K00240 and CLCS Project Glossary 84K00250.

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OPERATOR'S MANUAL

COMMON GATEWAY SERVICES CSCI

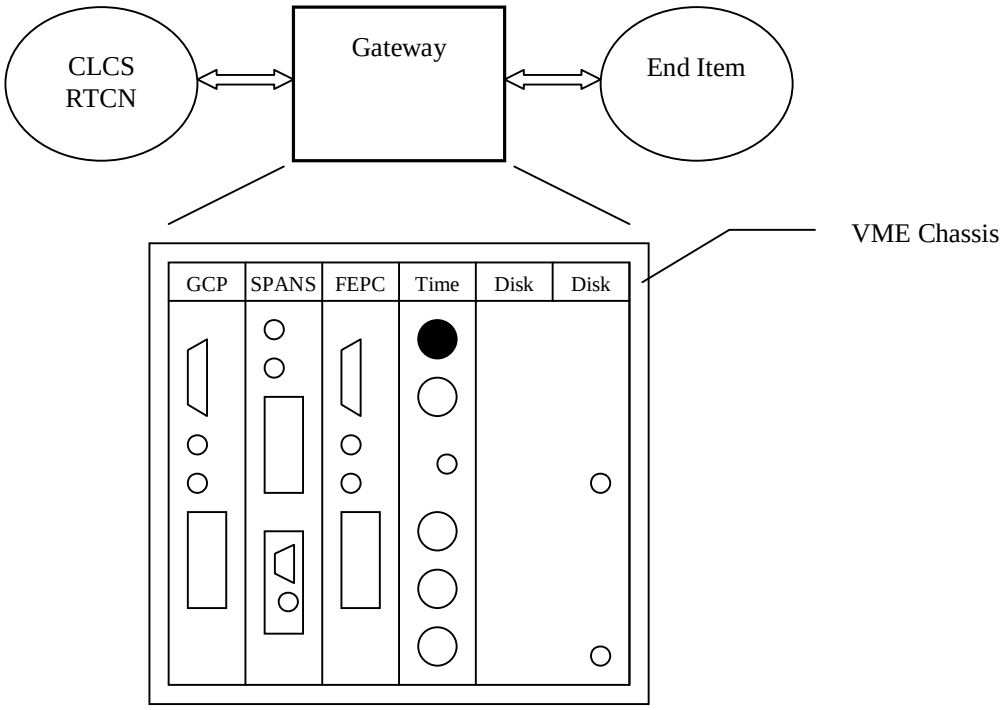
CHECKOUT AND LAUNCH CONTROL SYSTEM (CLCS)

1. INTRODUCTION

The purpose of this document is to provide an operating knowledge of those functions and tools that are common to all Gateways. The contents are intended to outline the Configuration of all Gateways and to outline analysis tools available on the Gateway during development, integration, or maintenance of the Common Gateway Services CSCI software.

2. OVERVIEW OF THE GATEWAY

All Gateways are multiprocessor VME systems that handle the interface between Checkout and Launch Control System (CLCS) and the front-end hardware/software associated with Launch Processing. The Gateways are the successors to the Front End Processors (FEPs) used in the Checkout, Control, and Monitor Subsystem (CCMS).



The Gateway provides the interface between the CLCS Real-Time Critical Network (RTCN), and the hardware interface to flight/ground equipment. The most basic Gateway contains a Gateway Control Processor, a Front-End Process Controller, a Time Board, and a local Disk.

2.1 GATEWAY CONTROL PROCESSOR (GCP)

The Gateway Control Processor (GCP) is the processor board in the Gateway that controls all of the Gateway's communication links with the RTCN, as well as access to the Utility network, and the Gateway's local hard drive. The software running on the GCP is common throughout all Gateways. There can be only one GCP in any Gateway.

All of the software running on the GCP is from the Common Gateway Services CSCI. This software is responsible for the management of all of the Gateways communication, both internal and external. A series of Shared Memory facilities exists between all of the processors in the Gateway. These facilities are physically located on the GCP, but are logically mapped from other Gateway processors. The availability of shared memory allows efficient interprocessor communication for all CPUs in the VME system.

In the VME Chassis, the GCP is always seated in the Gateway's Bus Controller slot (Slot 0, the left-most slot). Attahced to the GCP is a board called the SPANS module. It should be seated just to the right of the GCP (Slot 1). The SPANS module provides additional PCI Mezzanine Card (PMC) slots for the GCP. The GCP uses these PMC slots for its Primary and Secondary RTCN Interface boards.

2.2 FRONT-END PROCESS CONTROLLER (FEPC)

The Front-End Process Controller (FEPC) provides the direct interface to the specific End Item that makes the Gateway unique. For example, in the Simulation Gateway, the FEPC provides the interface to the Processor board running the SGOS model. The software running on the FEPC is unique to the type of Gateway, but contains some Common Gateway Services CSCI software. This Common software is used for Gateway Subsystem Integrity and interfacing with the GCP using the shared memory facilities. There can be one or more FEPCs in any Gateway.

In the VME Chassis, there are no restrictions as to where the FEPC is seated, except that it may not be the Bus Controller. The FEPC is a processor board and will usually be the same type of processor board as the GCP. Often, in conjunction with a FEPC, a Gateway will require a VME board that provides a hardware interface with whatever End Item the Gateway is servicing. For example, the GSE Gateway requires a MICC board, and a MTC board to interface with the Hardware Interface Modules (HIMs). The FEPC handles communication with the specialized interface boards. This communication does not involve using the shared memory facilities.

2.3 GATEWAY DISK

Each Gateway contains a local hard dive which is accessible via the GCP. The Gateway Disk is the source for the Gateway's load of object files and tables with every boot. Operating System images, software objects, and static tables are all stored and retrieved from the Gateway Disk. The Gateway Disk's directory structure should be configured before any Gateway downloads are attempted. The Gateway Disk's file structure is outlined in section 3.1.

2.4 TIME BOARD

The Time board is the time reference for the Gateway. The GCP reads from the Time Board before any CLCS network transmission is made. For example, Change Data, which is outputted at the System Synchronous Rate (SSR), is timestamped using a read from the Time Board with every transmission. Operationally, the Time Board is sourced by an IRIG-B signal for synchronization across Gateways. The IRIG-B signal is not required for a Gateway to operate

3. GATEWAY CONTROL PROCESSOR'S NON-VOLATILE RAM

3.1 NVRAM CONFIGURATION IN MEMORY

The GCP contains several Non-Volatile RAM (NVRAM) variables which must be set during the Configuration of the Gateway. These variables can also be altered at any time without the need to recompile any software. The following NVRAM variables have been allocated:

Description	Variable Name	GCP Address
Byte that Enables/Disables the Logging of messages to a Log File	LOG_FILE_ENABLE	0x1fe0
Byte that Enables/Disables using the Fast Ethernet PMC card for RTCN Communications	FAST_ETHER_ENABLE	0x1fdf
Byte that Enables/Disables the Standalone mode for the Gateway	GCP_STANDALONE	0x1fde
These 4 bytes are the string that describes the Facility where this Gateway resides.	FACILITY3 FACILITY2 FACILITY1 FACILITY0	0x1fdd 0x1fdc 0x1fdb 0x1fda
These 4 bytes store the integer representation of the Gateway's RTCN Broadcast Address.	BCAST_BYTE3 BCAST_BYTE2 BCAST_BYTE1 BCAST_BYTE0	0x1fd9 0x1fd8 0x1fd7 0x1fd6
These 4 bytes store the integer representation of the Gateway's RTCN Netmask.	NETMASK_BYTE3 NETMASK _BYTE2 NETMASK _BYTE1 NETMASK _BYTE0	0x1fd5 0x1fd4 0x1fd3 0x1fd2
These 6 bytes store the ascii string that is the prefix used for all Physical Gateway Streams.	PHYS_STREAM_PREFIX_BYTE5 PHYS_STREAM_PREFIX_BYTE4 PHYS_STREAM_PREFIX_BYTE3 PHYS_STREAM_PREFIX_BYTE2 PHYS_STREAM_PREFIX_BYTE1 PHYS_STREAM_PREFIX_BYTE0	0x1fd1 0x1fd0 0x1fcf 0x1fce 0x1fcd 0x1fcc
These 6 bytes store the ascii string that is the prefix used for all System Gateway Streams.	SYS_STREAM_PREFIX_BYTE5 SYS_STREAM_PREFIX_BYTE4 SYS_STREAM_PREFIX_BYTE3 SYS_STREAM_PREFIX_BYTE2 SYS_STREAM_PREFIX_BYTE1 SYS_STREAM_PREFIX_BYTE0	0x1fcb 0x1fca 0x1fc9 0x1fc8 0x1fc7 0x1fc6

Note that any time the GCP is replaced in the Gateway, or any time the Addresses for these NVRAM variables changes, all NVRAM variables must be reset.

3.2 NVRAM FUNCTIONS ON THE GATEWAY

A suite of functions is available from the GCP Console port to configure the NVRAM settings. The following functions are used to set the NVRAM variables:

Note: The Common Gateway Services CSCI software (cgsGcp.o) must be loaded on the GCP to perform these functions. The software does not need to be running, only loaded.

3.2.1 cgsLogFileEnable

Enables the logging of the Gateway's messages to a log file. If this is not Enabled, the Gateway will not record any messages.

```
sde1gwgse1-> cgsLogFileEnable
value = 0 = 0x0
```

3.2.2 cgsLogFileDisable

Disables the logging of the Gateway's messages to a log file.
e.g.

```
sde1gwgse1-> cgsLogFileDisable
value = 0 = 0x0
```

3.2.3 cgs100BaseTEnable

Enables the Fast Ethernet and the PMC module for the Gateway's RTCN interface. If this is not Enabled, the Gateway will use 10 BaseT and the Utility network for its RTCN communications.
e.g.

```
sde1gwgse1-> cgs100BaseTEnable
value = 0 = 0x0
```

3.2.4 cgs10BaseTEnable

Disables the Fast Ethernet and the PMC module for the Gateway's RTCN interface. The Gateway will use 10 BaseT and the Utility network for its RTCN communications.
e.g.

```
sde1gwgse1-> cgs10BaseTEnable
value = 0 = 0x0
```

3.2.5 gcpStandaloneEnable

Enables the Standalone mode. The Standalone mode assumes that no RTCN is available.
e.g.

```
sde1gwgse1-> gcpStandaloneEnable
value = 0 = 0x0
```

3.2.6 gcpStandaloneDisable

Disables the Standalone mode. When disabled, attempts at connection over the RTCN are allowed.
e.g.

```
sde1gwgse1-> gcpStandaloneDisable
value = 0 = 0x0
```

3.2.7 cgsSetFacility

Sets the Gateway's current Facility. The only argument to this command is the Facility character string. This string can be no more than 4 characters.
e.g.

```
sde1gwgse1-> cgsSetFacility "MLP1"
value = 0 = 0x0
```

3.2.8 cgsSetRtcnBcastAddr

Sets the Gateway's RTCN broadcast address. The only argument to this command is the broadcast address character string (in IP dot notation).
e.g.

```
sde1gwgse1-> cgsSetRtcnBcastAddr "172.16.255.255"
value = 0 = 0x0
```

3.2.9 cgsSetRtcnNetmask

Sets the Gateway's RTCN Netmask. The only argument to this command is the Hexadecimal representation of the Netmask.
e.g.

```
sde1gwgse1-> cgsSetRtcnNetmask 0xffff0000
value = 0 = 0x0
```

3.2.10 cgsSetPhysStreamNamePrefix

Sets the Activity Type field for the Gateway's Physical Stream Names. The Physical Stream Names are those between the Gateway and Ops CM, and the Gateway and System Integrity. The only argument to this command is the prefix character string. This string can be no more than 5 characters.
e.g.

```
sde1gwgse1-> cgsSetPhysStreamNamePrefix "NULL"
value = 0 = 0x0
```

3.2.11 cgsSetSysStreamNamePrefix

Sets the Activity Type field for the Gateway's System Stream Names. The System Stream Names are those that the Gateway uses for System Message communications, and Archive Data communications. The only argument to this command is the prefix character string. This string can be no more than 5 characters.
e.g.

```
sde1gwgse1-> cgsSetSysStreamNamePrefix "NULL"
value = 0 = 0x0
```

4. GATEWAY DISK

4.1 DIRECTORY STRUCTURE

The Gateway's Disk is the Gateway's local repository for SCID and TCID files, and Maintenance User Interface files. It also provides a medium for storing Log messages, Recovery dumps, and Checkpoints. The Gateway Disk has an organized file structure to make downloads and retrievals easy to implement. Below is an outline of the Gateway Disk structure and the files it contains. Each file entry is formatted as follows:

Filename
A brief description of the file's purpose or contents
The CSCI or CSC responsible for providing the file

The root directory for all Gateway Disks is "/sd0:/". The Gateway Disk file structure is as follows:

/sd0:/

-> **scid/**

-> **vxWorks.gcp**
The VxWorks OS image for the Gateway Control Processor (GCP)
Common Gateway Services CSCI

-> **vxWorks.gcp.sym**
The VxWorks Symbol Table for the Gateway Control Processor (GCP)
Common Gateway Services CSCI

-> **vxWorks.fepc**
The VxWorks OS image for the Front End Process Controller (FEPC)
Common Gateway Services CSCI

-> **vxWorks.fepc.sym**
The VxWorks Symbol Table for the Front End Process Controller (FEPC)
Common Gateway Services CSCI

-> **cgsGcp.o**
The Common Gateway Services CSCI object module
Common Gateway Services CSCI

-> **gcp.scr**
The Common Gateway Services Startup Script
Common Gateway Services CSCI

-> **<gateway type>Fepc.o**
The Gateway-specific object module, where <gateway type> is gse, pcm, etc.
Gateway Specific CSCI

-> **<gateway type>Fepc.scr**
The Gateway-specific Startup Script, where <gateway type> is gse, pcm, etc.
Gateway Specific CSCI

```
|          |-> resource.txt
|          |   The System Configuration Table Resource file
|          |   System Integrity CSC
|          |
|          |-> subsys.txt
|          |   The System Configuration Table Subsystem file
|          |   System Integrity CSC
|          |
|          |-> res2ss.txt
|          |   The System Configuration Table Resource mapping to Subsystem file
|          |   System Integrity CSC
|          |
|          |-> IDD_rel_mc_addrs.txt
|              The Reliable Multicast file for the Test Set
|              Reliable Messages CSC
|
|-> tcid/
|          |
|          |-> <TCID 1>/
|          |   A TCID that has been downloaded to the Gateway (a directory)
|          |   Test Build CSC?
|          |          |
|          |          |-> act_data
|          |              The Activity Data file for this TCID's Activity
|          |              Ops CM CSC
|          |
|          |   .
|          |   .
|          |   .
|          |-> <TCID N>/
|              TCID that has been downloaded to the Gateway (a directory)
|              Test Build CSC?
|                     |
|                     |-> act_data
|                         The Activity Data file for this TCID's Activity
|                         Ops CM CSC
|
|-> log/
|   Contains Log files generated by the Gateway during operation
|
|-> html/
           |
           |-> docs/
           |          |
           |          |-> change-time.html
           |          |   The HTML page for changing the Gateway's TOD clock.
           |          |   Common Gateway Services CSCI
           |          |
           |          |-> cmd-resp-stats.html
           |          |   The HTML page for the Gateway's Command/ Response statistics.
           |          |   Common Gateway Services CSCI
           |          |
           |          |-> index.html
           |          |   The Gateway's HTML Home page.
           |          |   Common Gateway Services CSCI
           |          |
```

| |-> **multicast-streams-table.html**
| | The HTML page for viewing the Gateway's RM Multicast Table.
| | Common Gateway Services CSCI
| |
| |-> **ron-stats.html**
| | The HTML page for viewing the RON Network Statistics.
| | Common Gateway Services CSCI
| |
| |-> **rtcn-stats.html**
| | The HTML page for viewing the RTCN Network Statistics.
| | Common Gateway Services CSCI
| |
| |-> **send-commands.html**
| | The HTML page for Sending commands to the Gateway.
| | Common Gateway Services CSCI
| |
| |-> **show-routine.html**
| | The HTML page for viewing Gateway Tables.
| | Common Gateway Services CSCI
| |
| |-> **streams-table.html**
| | The HTML page for viewing Gateway's Active Streams Table.
| | Common Gateway Services CSCI
| |
| |-> **task-health-table.html**
| | The HTML page for viewing the Gateway's Task Health Table.
| | Common Gateway Services CSCI
| |
| |-> **tcid-display.html**
| | The HTML page for viewing the TCID Tables.
| | Common Gateway Services CSCI
| |
| |-> **view-files.html**
| | The HTML page for viewing files on the Gateway's DIsk.
| | Common Gateway Services CSCI
| |
| |-> **view-logs.html**
| | The HTML page for viewing the Gateway's Log files.
| | Common Gateway Services CSCI
|
|-> **images/** (all provided by Common Gateway Services CSCI)
| |
| |-> **Analyze_Recovery_Dump.gif**
| |-> **Command-Response_Statistics.gif**
| |-> **List-View_TCID_Tables.gif**
| |-> **RON_Statistics.gif**
| |-> **RTCN_Statistics.gif**
| |-> **Send_Commands.gif**
| |-> **Set_Time.gif**
| |-> **View_Cyclic_FD_Table.gif**
| |-> **View_Info-Error_Logs.gif**
| |-> **View_Misc_Show_Routines.gif**
| |-> **View_Multicast_Streams_Table.gif**
| |-> **View_Network_Streams_Table.gif**
| |-> **View_Routing_Tables.gif**
| |-> **View_Shared_Memory_Queues.gif**

```
|          |-> View_Task_Health_Table.gif
|          |-> View_Transaction_Tables.gif
|          |-> backgrd.jpg
|          |-> clcs-logo.gif
|          |-> envelope-60x22.gif
|          |-> ksc-logo-small.gif
|          |-> ksc-logo.gif
|          |-> nasa-logo-small.gif
|          |-> nasa-logo.gif
|          |-> orange.gif
|          |-> phone-handset-40x30.gif
|          |-> pixel-clear.gif
|
|-> java/  (all provided by Common Gateway Services CSCI)
          |
          |-> cgsMuiApplet.class
          |-> cgsMuiFrameBuilder.class
          |-> cgsMuiGcpTime.class
          |-> cgsMuiGcpTimeFrameBuilder.class
          |-> cgsMuiLabel.class
          |-> cgsMuiLiveData.class
          |-> cgsMuiSendCommands.class
          |-> cgsMuiSendCommandsFrameBuilder.class
          |-> cgsMuiShowFile.class
          |-> cgsMuiShowFileDisplayBuilder.class
          |-> cgsMuiShowRoutine.class
          |-> cgsMuiTcidDisplay.class
          |-> cgsMuiTcidDisplayFrameBuilder.class
          |-> cgsMuiThread.class
          |-> cgsMuiViewLogs.class
          |-> cgsMuiViewLogsFrameBuilder.class
          |-> fileLoadDialog.class
          |-> fileRetrieveThread.class
```

4.2 FILE FORMATS

Outlined in this section are the Static tables and files provided to the Gateway by other CSCIs.

4.2.1 Activity Definition File

The activity file is created and loaded by OPS CM as part of the gateway's TCID. The Activity File is the Gateway's only source for the type of Activity in which it participates. It is used for building Command and Change Data stream names and is referenced when a Configuration Status is requested of the Gateway.

Name: act_data
Directory: /sd0:/tcid/<TCID Name>, where <TCID Name> is a downloaded TCID
Format:

Line #	Field Description	Format	Max. Length
1	Activity Name	Null-terminated ASCII string	30
2	SCID Version	Null-terminated ASCII string	30
3	TCID Name	Null-terminated ASCII string	30
4	Tail ID	Null-terminated ASCII string	8
5	Flight Number	Null-terminated ASCII string	10
6	End Item Location	Null-terminated ASCII string	8

Example:
DEV
scid.thor.1.22
SA088T0
OV-105
STS088
OPF3

4.2.2 Reliable Multicast Table

The Reliable Multicast Table provides a map of all communication paths in the Set. Each communications path to/from the Gateway is named in this file. The Reliable Multicast Table is referenced whenever a Stream is opened on the Gateway. No stream may be opened that is not named in this file. This table is provided by System Services CSCI.

Name: IDD_rel_mc_addrs.txt
Directory: /sd0:/scid
Format:

Field	Type	Contents
Stream Name	String	The ASCII name of the data stream.
Address	String	The IP address of the data stream (broadcast or multicast).
Port Number	Integer	The UDP port number associated with the data stream.
Source Hostname	String	The specific host from whom the transmission is expected.
Timeout	Integer	The Timeout between transmission retries in milliseconds.
Number of Retries	Integer	The maximum number of retries before returning an error.

Example:

DEV_OPF3_STS088_CCP1-GS1A-REQ	163.206.255.255	12344	sde1ccp1-r	50	3
DEV_OPF3_STS088_CCP1-GS1A-RSP	163.206.255.255	12346	sde1gwgse1-r	50	3
DEV_OPF3_STS088_GS1A-DDP	163.206.255.255	12348	sde1gwgse1-r	50	3
NULL_NULL_NULL_OCM-sde1gwgse1-REQ	163.206.255.255	12350	sde1boot-r	50	3

4.2.3 Resource File

This file specifies the parameters for the individual resources in the Set.
Name: resource.txt
Directory: /sd0:/scid
Format: Comma delimited

Field	Type	Contents
Host Name	String	The commonly used name for the Resource. This name is unique.
Physical ID	Int16	Number that uniquely identifies the resource within the set.
Reference Designator	String	This field specify the physical location of the resource
Primary RTCN IP Address	String	Defines the IP Address to be used by the Resource when communicating on the Primary RTCN. This field may be null (for gateways)
Backup RTCN IP Address	String	Defines the IP Address to be used by the Resource when communicating on the Backup RTCN. This field may be null (for gateways and all processors prior to installation of the backup RTCN).
Primary DCN IP Address	String	Defines the IP Address to be used by the Resource when communicating on the Primary DCN. This field may be null (for CCWSs)
Backup DCN IP Address	String	Defines the IP Address to be used by the Resource when communicating on the backup DCN. This field may be null (for CCWSs and all processors prior to the installation of the backup DCN)

Example:
ide1ccp1,1,1A365,123.123.255.255,123.123.255.255,123.123.255.255,123.123.255.555
ide1ccp2,2,1A366,233.233.233.233,233.233.233.233,233.233.233.233,233.223.223.223
ide1ddp1,3,1A399,433.433.433.433,555.555.555.555,444.444.444.444,333.333.333.333
ide1ddp2,4,1A400,433.433.433.433,111.111.111.111,222.222.222.222,333.333.333.333
ide1gwgse1,5,2A120,433.433.433.433,322.222.222.222,334.343.434.343,212.341.234.123
ide1gwgse2,6,2A250,344.344.344.344,333.333.333.333,123.412.341.234,234.123.412.341

4.2.4 Subsystem File

This file specifies the definition of the Subsystem
Name: subsys.txt
Directory: /sd0:/scid
Format: Comma delimited

Field	Type	Contents
Subsystem Name	String	The name of the subsystem being defined. Because this file is used by Set Integrity, a given subsystem name may appear more than once. The combination of Test Set/Subsystem Name is unique within the file.
Logical ID	Int16	Unique identifier for the subsystem. Used as the CPU ID in the network message header.
Switchover Enabled	Integer	When 0, Switchover is disabled. When 1 it is enabled. No other value is valid.
Role	Integer	0 = No Assigned Role 1 = Active 2 = Standby 3 = Hot Spare
Classification	Integer	The Type of Subsystem 0 = No Assigned Classification 1 = CCP 2 = Master CCP 3 = DDP

		4 = CCWS 5 = Master CCWS 6 = Ops/CM 7 = Gateway

Example:
CCP1S,2,0,2,2
GSE1A,3,1,1,7

4.2.5 Resource to Subsystem Mapping File

This file specifies the mapping between resources and subsystems.
Name: res2ss.txt
Directory: /sd0:/scid
Format: Comma delimited

Field	Type	Contents
Subsystem Name	String	The Subsystem Name. This is one of the Subsystems identified in the Subsystem File.
Resource Name	String	The Host Name of the resource. This is one of the resources identified in the Resource file.

Example:
CC1S,ide1ccp2
DD1A,ide1ddp1
GS1A,ide1gwgse1

5. COMMAND LINE FUNCTIONS

The GCP and FEPC Console ports make available a suite of functions that may be used as status, debug, or analysis tools. Any of these functions may be typed at the console port of a Gateway CPU. A Gateway CPU's Console Port can be accessed by opening a telnet session to the Communications Server on the appropriate port. Some functions apply to all Gateway CPUs, but some are either GCP or FEPC specific. All of the available functions are outlined in this section.

5.1 COMMAND LINE SHOW ROUTINES

5.1.1 cgsShowRouteTable

This function will display the current contents of the GCP's Route Table. The Route Table is the reference used by the GCP to route incoming RTCN commands to the correct Gateway CPU. This table is indexed by the Route Code and Request ID of an incoming command. Once found in the Route Table, an incoming command is distributed to the Route Entry's list of Gateway CPUs. Note that the Gateway CPU number does not correlate to the CLCS logical CPU ID. This function is available only on the GCP.
e.g.

```
sde1gwgse1-> cgsShowRouteTable


Registered Routes:

Route Code  # Request IDs
----------  -------------
         5              3
        18              1

Route Table:

Index       Route Code  Request ID  # CPUs  CPUs Targeted
----------  ----------  ----------  ------  -------------
  00050001           5           1       1  0
  00050003           5           3       2  0, 1
  00050004           5           4       2  0, 1
  00180001          18           1       2  0, 1
```

5.1.2 cgsShowTransTable

This function will display the current contents of the GCP's Transaction Table. The Transaction Table is the reference used by the GCP to track all outstanding commands in the Gateway. This table is indexed by an Gateway-internal Transaction Index. All Gateway transactions are timed by the GCP. Note that the Gateway-internal Transaction Index does not correlate to the command's Transaction ID. This function is available only on the GCP.
e.g.

```
sde1gwgse1-> cgsShowTransTable


Active Transaction Table:

Trans Index  Num CPUs  TimerID     IssCnt  CmpCnt  Timeout(ms)
```

```
----------  --------  ----------  ------  ------  ----------
```

5.1.3 cgsShowTaskHealthTable

This function will display the current contents of the GCP's Task Health Table. The Task Health Table tracks the Health of Tasks on all Gateway CPUs. This table is indexed by each Task's Task ID. This function is similar to the VxWorks shell function "i". This function is available on the GCP and all Gateway FEPCs.
e.g.

```
sde1gwgse1-> cgsShowTaskHealthTable


Task Health Table

Task ID     Task Name   Present  Status      Critical  Inhibited
----------  ----------  -------  ----------  --------  ---------
0x01b77658   tInitScid     TRUE      PEND+T      TRUE      FALSE
0x01b72588   tCyclicFd     TRUE        PEND      TRUE      FALSE
0x01b6fc40  tSysEvtGen     TRUE        PEND      TRUE      FALSE
0x01b6d2f8  tSysEvtRcv     TRUE       DELAY      TRUE      FALSE
0x01b4cb80     LOG_MSG     TRUE        PEND      TRUE      FALSE
0x01b4a978  ssrSemGive     TRUE        PEND      TRUE      FALSE
0x01ae6f80      tShell     TRUE       READY      TRUE      FALSE
0x01b7f5d8  UTCmonitor     TRUE       DELAY      TRUE      FALSE
0x01ae0010   RM_SVR_19     TRUE        PEND      TRUE      FALSE
0x01ad2988  tSysMsgGen     TRUE        PEND      TRUE      FALSE
0x01ad13f8  tArcDatGen     TRUE        PEND     FALSE      FALSE
0x01ac7c60       tRshd     TRUE        PEND     FALSE      FALSE
0x01ac66d0  tMuiRelayd     TRUE        PEND     FALSE      FALSE
0x01ac16a8  tMuiWbDatd     TRUE        PEND     FALSE      FALSE
0x01ab5070  tcgsCmdReg     TRUE        PEND      TRUE      FALSE
0x01aa5b88  tGwyMsgGen     TRUE        PEND      TRUE      FALSE
0x01a9a138  tcgsRcvCmd     TRUE        PEND      TRUE      FALSE
0x01a8ac50  tcgsGenRsp     TRUE        PEND      TRUE      FALSE
0x01a85c28  tcgsTimOut     TRUE        PEND      TRUE      FALSE
0x01a80c00  tgcpCmdPrc     TRUE        PEND      TRUE      FALSE
0x01acc5b8   RM_SVR_21     TRUE        PEND      TRUE      FALSE
0x01a5bbf0   RM_SVR_28     TRUE        PEND      TRUE      FALSE
0x01a56a68   RM_SVR_30     TRUE        PEND      TRUE      FALSE
0x01a554d8   RM_RCV_32     TRUE        PEND      TRUE      FALSE
```

5.1.4 cgsShowCyclicFdTable

This function will display the current contents of the GCP's Cyclic FD Table. The Cyclic FD Table is responsible for reporting those FDs that are updated at a specific rate (e.g., System Status FDs). At any time an FD may be registered into the Cyclic FD Table from either a Task or the Shell. This function is available on the GCP and all Gateway FEPCs.
e.g.

```
sde1gwgse1-> cgsShowCyclicFdTable


Gateway CPU 00 Cyclic FD Table:

FD ID       FD Size(bytes)  Rate(ms)  Last Value
----------  --------------  --------  ----------
0x0000b885               4      1000  0x0
0x0000b886               4      1000  0x0
0x0000b861               4      1000  0x0
```

```
0x0000b861              4       1000  0x0
0x0000b883              4       1000  0x0
0x0000b884              4       1000  0x0
0x0000bb5b              4       1000  0x0
0x0000bb5c              4       1000  0x0
0x0000bb5d              4       1000  0x0
0x0000bb83              4       1000  0x0
0x0000b887              4       1000  0x0
0x0000bb5f              4       1000  0x0
0x0000bb80              4       1000  0x0
```

5.1.5 cgsShowSysStreamNamePrefix

This function will print to the screen the System Stream Name Prefix. This string is an NVRAM variable set during configuration of the Gateway. It is the System Stream Prefix that is used for the System Message and Block Logging Streams.

e.g.

```
sde1gwgse1-> cgsShowSysStreamNamePrefix

System Stream Name prefix is: CIT
```

5.1.6 cgsShowPhysStreamNamePrefix

This function will print to the screen the Physical Stream Name Prefix. This string is an NVRAM variable set during configuration of the Gateway. It is the Physical Stream Prefix that is used for the Streams that communicate with Ops CM and System Integrity.

e.g.

```
sde1gwgse1-> cgsShowPhysStreamNamePrefix

Physical Stream Name prefix is: NULL
```

5.1.7 cgsShowFacility

This function will print to the screen the Facility in which the Gateway resides. This string is an NVRAM variable set during configuration of the Gateway.

e.g.

```
sde1gwgse1-> cgsShowFacility
PADA
```

5.1.8 cgsShowGwname

This function will print to the screen the logical name of this Gateway. This information is derived from the SCT.

e.g.

```
sde1gwgse1-> cgsShowGwname
GS1A
```

5.1.9 cgsShowRefDes

This function will print to the screen the Reference Designator of this Gateway. This information is derived from the SCT.
e.g.

```
sde1gwgse1-> cgsShowRefDes

Reference Designator: 52170
```

5.1.10 cgsShowSct

This function will print to the screen the Gateway's current copy of the System Configuration Table (SCT). The SCT is provided by System Integrity and contains the state of all machines in the Set. The SCT is updated by System Event Codes from System Integrity.
e.g.

```
sde1gwgse1-> cgsShowSct


System Configuration Table:

Hostname        Phys Id  Log Id  Log Name  Ref Des  Class  Role    Swtchovr  State
--------------  -------  ------  --------  -------  -----  ------  --------  -----
      sde1ddp1       65      11      DDPA    52150    DDP  Active  Disabled  Unkwn
      sde1ddp2       66      12      DDPS    52151    DDP  Stndby  Disabled  Unkwn
      sde1ccp1       67      13      CC1A    52152    CCP  Active  Disabled  Unkwn
      sde1ccp2       68      14      CC1S    52153    CCP  Stndby  Disabled  Unkwn
    sde1gwgse1       69      17      GS1A    52170    GWY  Active  Disabled  Unkwn
    sde1gwgse2       70       0      NONE    52171  Unkwn  NoRole  Disabled  Unkwn
    sde1gwgse3       71       0      NONE    52172  Unkwn  NoRole  Disabled  Unkwn
    sde1gwgse4       72       0      NONE    52173  Unkwn  NoRole  Disabled  Unkwn
    sde1gwgse5       73       0      NONE    52174  Unkwn  NoRole  Disabled  Unkwn
    sde1gwldb1       74      22      LDBA    52175    GWY  Active  Disabled  Unkwn
    sde1gwldb2       75      23      LDBS    52176    GWY  Stndby  Disabled  Unkwn
   sde1gwpcmd1       76      24      OFIA    52177    GWY  Active  Disabled  Unkwn
   sde1gwpcmd2       77       0      NONE    52178  Unkwn  NoRole  Disabled  Unkwn
   sde1gwpcmu1       78      26      UPLK    52179    GWY  Active  Disabled  Unkwn
   sde1gwpcmu2       79       0      NONE    52180  Unkwn  NoRole  Disabled  Unkwn
   sde1gwssme1       80      28      SSME    52181    GWY  Active  Disabled  Unkwn
   sde1gwssme2       81       0      NONE    52182  Unkwn  NoRole  Disabled  Unkwn
    sde1gwsim1       82      30       SIM    52183    GWY  Active  Disabled  Unkwn
     sde1gwcs1       83      31      CGWA    52184    GWY  Active  Disabled  Unkwn
    sde1gwtdg1       84      32       TDG    52185    GWY  Active  Disabled  Unkwn
     sde1rtcn1       85       0      NONE    52130  Unkwn  NoRole  Disabled  Unkwn
     sde1rtcn2       86       0      NONE    52131  Unkwn  NoRole  Disabled  Unkwn
      sde1boot       88       0      NONE    52190  Unkwn  NoRole  Disabled  Unkwn
```

5.1.11 cgsShowRtcnBcastAddr

This function will print to the screen the current RTCN Broadcast Address for this Gateway. This string is an NVRAM variable set during configuration of the Gateway.
e.g.

```
sde1gwgse1-> cgsShowRtcnBcastAddr

RTCN Broadcast Address: 172.16.255.255
```

5.1.12 cgsShowRtcnNetmask

This function will print to the screen the current RTCN Netmask for this Gateway. This string is an NVRAM variable set during configuration of the Gateway.
e.g.

```
sde1gwgse1-> cgsShowRtcnNetmask

RTCN Netmask: 0xffff0000
```

5.1.13 cgsShowTcidData

This function will print to the screen information associated with the currently loaded TCID in the Gateway. If no TCID is loaded, much of this information will not be reported.
e.g.

```
sde1gwgse1-> cgsShowTcidData


TCID Data:

Activity Name:     DEV
SCID Version:      scid.thor.2.3
TCID Version:      SA089R1
Tail ID:           OV-105
Flight Number:     STS089
End Item Location: PAD-A
Gateway Name:      GS4A
Gateway Prefix:    DEV_PAD-A_STS089_
Gateway CPU ID:    1
```

5.1.14 cgsShowCurrentTime

This function will perform a read of the current time as reported by the Gateway's Time Board. This time will be printed to the screen in the format that it is transmitted as it is used for outgoing gateway timestamps.
e.g.

```
sde1gwgse1-> cgsShowCurrentTime


Current Time Values:

Status: 0
Year:   1998
Jtoy:   110
Mstod:  49927768
100us:  0
```

5.1.15 cgsShowRegisteredCpus

This function will print to the screen information on the local Gateway CPUs that have registered with the GCP. In most Gateways, this list will consist of only the GCP and the FEPC. In Gateways with multiple FEPCs, this list should include all of them.

e.g.

```
sde1gwgse1-> cgsShowRegisteredCpus

Gateway Registered CPUs

Name    Hi Cmd Q    Norm Cmd Q  Cmd Sem     Rcv Resp Q
------  ----------  ----------  ----------  ----------
 cpu00  0x01a6f280  0x01a64e60  0x01fff1b0  0x01a5aa40
 cpu01  0x0002fe41  0x0002fdc1  0x0002d0c1  0x0002fd41
```

5.1.16 cgsShowConfigStatus

This function will print to the screen the Gateway's Configuration Status. This Configuration Status is the exact status that is reported to the Ops CM server during Gateway Initialization. The Status reflects the Gateway's current Initialization mode, SCID Version, and TCID Name. Also, this command reports what TCIDs are currently available for the Gateway to load.
e.g.

```
sde1gwgse1-> cgsShowConfigStatus


Gateway Configuration Status:

       Init Mode:        2
       SCID Version:     scid.thor.2.3
       TCID Name:        SA089R1
       Available TCID:   SA089R1
```

cgsShowCpus
This function displays to the screen a matrix of the logical CPUs in this Set.
e.g.

```
sde1gwgse1-> cgsShowCpus

Name   Id  State
DDPA   11  UNDEFINED
DDPS   12  UNDEFINED
CC1A   13  UNDEFINED
CC1S   14  UNDEFINED
GS1A   17  UNDEFINED
LDBA   22  UNDEFINED
LDBS   23  UNDEFINED
OFIA   24  UNDEFINED
UPLK   26  UNDEFINED
SSME   28  UNDEFINED
SIM    30  UNDEFINED
CGWA   31  UNDEFINED
TDG    32  UNDEFINED
```

5.1.17 cgsShowGwSharedMem

This function displays to the screen the information contained in the Gateway's Shared Memory Area. This block of memory, which is physically located on the GCP, is shared by the GCP and all FEPCs in the Gateway. Information contained in this Area include: the Logical Name, the Facility, the Subsystem Integrity Mode, the availability of switchover, and a matrix of the logical CPUs in this set (as provided by the SCT).
e.g.

```
sde1gwgse1-> cgsShowGwSharedMem


Gateway Shared Memory Area:

Gateway Name:               GS1A
Gateway Facility:           PADA
Gateway SSI Mode:           1
Gateway Switchover Enabled: 0

CPU ID  Logical Name  State
------  ------------  -----
    11          DDPA      0
    12          DDPS      0
    13          CC1A      0
    14          CC1S      0
    17          GS1A      0
    22          LDBA      0
    23          LDBS      0
    24          OFIA      0
    26          UPLK      0
    28          SSME      0
    30           SIM      0
    31          CGWA      0
    32           TDG      0
```

5.1.18 cgsShowStreamTable

This function displays to the screen the current state of all connected streams in the Gateway.
e.g.

```
sde1gwgse1-> cgsShowStreamTable


Gateway Network Streams Table:

sId   Name                                Type   Corr ID  Use       Err   Bytes
----  ----------------------------------  -----  -------  --------  ----  ----------
  19        NULL_NULL_NULL_REDMANGWYSEND   Send        0         0     0           0
  21              NULL_NULL_NULL_BFL-GWY   Send        0         0     0           0
  28              NULL_NULL_NULL_SMS-GWY   Send        0         0     0           0
  30   NULL_NULL_NULL_OCM-sde1gwgse1-RSP   Send       32        67     0        8978
  32   NULL_NULL_NULL_OCM-sde1gwgse1-REQ   Recv       30         0     0           0
```

5.1.19 cgsShowFdTables

This function prints to the screen a list of all System Status FDs loaded during TCID Initialization. Included in the list are both Physical and Logical FDs. This function is available on the GCP and all FEPCs.
Note: This list does not represent all FDs reported by the Gateway.
e.g.

```
sde1gwgse1-> cgsShowFdTables


Gateway FDs Table:
```

```
FD Name          FD Id
---------------  ----------
           GLEC  0x0000b85c
           GMEC  0x0000b85d
           GPEC  0x0000b85e
           GTEC  0x0000b85f
             HC  0x0000b860
          PKBTT  0x0000b861
           SREC  0x0000b862
          DISKE  0x0000bb80
          DISKU  0x0000bb5f
           PKBT  0x0000b882
           PKCR  0x0000b883
          PKCRT  0x0000b884
           PKCT  0x0000b885
          PKCTT  0x0000b886
           PKEC  0x0000b887
           ECR2  0x0000bb59
           PKBR  0x0000bb5b
          PKBXT  0x0000bb83
           MCST  0x0000bb82
          PKBTR  0x0000bb5d
          PKBRT  0x0000bb5c
           FIFO  0x0000bb5a
           UREC  0x0000bb84
           ECR1  0x0000bb81
          SGS2A  0x0000b80b
      SGS2AGCMD  0x0000b80c
     SGS2AGSWSC  0x0000b80d
     SGS2APOLLC  0x0000b80e
     SGS2GMPROC  0x0000b80f
        SGS1ASW  0x0000b815
     SGS1GMPROC  0x0000b816
      SGS2ACMDC  0x0000b817
     SGS2ADATAV  0x0000b818
     SGS2AGPOLL  0x0000b819
      SGS2ALOAD  0x0000b846
     SGS1AGCNHG  0x0000b85a
          SGSE03  0x0000b85b
           SGS1A  0x0000b867
     SGS1AGSWSC  0x0000b881
          SGSE01  0x0000b88f
      SGS1ALOAD  0x0000bb11
     SGS1APOLLC  0x0000bb12
     SGS2AGTACT  0x0000bb13
      SGS2ASTAT  0x0000bb14
           SGS3A  0x0000bb15
      SGS1ASTAT  0x0000bb1b
     SGS2AGCNHG  0x0000bb1c
     SGS2AINCON  0x0000bb1d
        SGS2ASW  0x0000bb48
          SGSE02  0x0000bb49
     SGS1AGPOLL  0x0000bb56
     SGS1AGTACT  0x0000bb57
     SGS1AINCON  0x0000bb58
     SGS1ADATAV  0x0000bb7e
      SGS1AGCMD  0x0000bb7f
      SGS1ACMDC  0x0000bb8a
```

5.1.20 cgsShowCommandTimerTable

This function displays to the screen the Command Timer Table. The Command Timer Table tracks commands coming through the GCP. It times the commands as they pass through the Gateway. The resolution of the Timer is only 1 millisecond. This is a tool designed to measure the performance of the

Gateway at the Command/Response level. The Command Timer Table must be enabled before it will begin tracking commands.
e.g.

```
sde1gwgse1-> cgsShowCommandTimerTable


Command Timer Table:

Orig CPU  Src CPU   Dest CPU  Rte Code  Reqst ID  Trans ID  Time(ms)
--------  --------  --------  --------  --------  --------  --------
       0         0         0         5         1         2         2
       0         0         0         5         1         2         0
       0         0         0         5         4         2         0

Average Command Processing Time: 0.00 (ms)
```

5.1.21 cgsShowChangeData

This function displays to the screen Change Data entries as they are added to the outgoing Change Data packet. This function takes an integer argument that specifies how many entries to report.
Warning: Printing large amounts of entries can disturb the normal processing of Change Data on the Gateway. Do not exceed 10 entries to be reported using this command.
e.g.

```
sde1gwgse1-> cgsShowChangeData 3
value = 3 = 0x3
sde1gwgse1-> 110/14:11:32.490(tcgsCDQSvr)0- CHG DATA:
110/14:11:32.490(tcgsCDQSvr)0-        DATA BYTE[0]: 0x25
110/14:11:32.490(tcgsCDQSvr)0-        DATA BYTE[1]: 0x00
110/14:11:32.490(tcgsCDQSvr)0-        DATA BYTE[2]: 0xb8
110/14:11:32.491(tcgsCDQSvr)0-        DATA BYTE[3]: 0x60
110/14:11:32.491(tcgsCDQSvr)0-        DATA BYTE[4]: 0x12
110/14:11:32.491(tcgsCDQSvr)0-        DATA BYTE[5]: 0x90
110/14:11:32.500(tcgsCDQSvr)0- CHG DATA:
110/14:11:32.500(tcgsCDQSvr)0-        DATA BYTE[0]: 0x24
110/14:11:32.500(tcgsCDQSvr)0-        DATA BYTE[1]: 0x00
110/14:11:32.500(tcgsCDQSvr)0-        DATA BYTE[2]: 0xb8
110/14:11:32.500(tcgsCDQSvr)0-        DATA BYTE[3]: 0x60
110/14:11:32.500(tcgsCDQSvr)0-        DATA BYTE[4]: 0x12
110/14:11:32.500(tcgsCDQSvr)0-        DATA BYTE[5]: 0x91
110/14:11:32.510(tcgsCDQSvr)0- CHG DATA:
110/14:11:32.510(tcgsCDQSvr)0-        DATA BYTE[0]: 0x24
110/14:11:32.510(tcgsCDQSvr)0-        DATA BYTE[1]: 0x00
110/14:11:32.510(tcgsCDQSvr)0-        DATA BYTE[2]: 0xb8
110/14:11:32.510(tcgsCDQSvr)0-        DATA BYTE[3]: 0x60
110/14:11:32.510(tcgsCDQSvr)0-        DATA BYTE[4]: 0x12
110/14:11:32.510(tcgsCDQSvr)0-        DATA BYTE[5]: 0x92
```

5.2 COMMAND LINE GET FUNCTIONS

5.2.1 cgsGetCpuInitMode

This function reports the current Initialization Mode of the Gateway. The argument to this function is the Gateway CPU number. The current Initialization Mode will be reported as an integer. The value of the integer correlates to the Initialization Mode in the following manner:

Returned Integer Value	Gateway Initialization Mode
0	SCID Initialization
1	SCID/TCID Load Mode
2	Ready Mode
3	Operational Mode

This function is available only on the GCP.
e.g.

```
sde1gwgse1-> cgsGetCpuInitMode
value = 0 = 0x0
```

5.2.2 cgsGet100BaseTEnable

This function reports the state of the 100baseTEnable NVRAM Variable. If this variable is set, the Gateway will use the RTCN as the network for all communications. If this variable is not set, the Gateway will use its Utility network connection for all communications.
e.g.

```
sde1gwgse1-> cgsGet100BaseTEnable
value = 1 = 0x1
```

5.2.3 cgsGetNumCommandTimeouts

This function reports the number of Command Timeouts the Gateway Command and Response CSC has encountered. This number is an integer and is the return value of the command.
e.g.

```
sde1gwgse1-> cgsGetNumCommandTimeouts
value = 0 = 0x0
```

5.2.4 cgsGetSSR

This function reports the current System Synchronous Rate that the Gateway is using. This number is an integer and is the return value of the command.
e.g.

```
sde1gwgse1-> cgsGetSSR
value = 10 = 0xa
```

5.2.5 cgsGetGwCpuId

This function reports the logical CPU ID of the Gateway. The reported number is an integer and is the return value of the command. The returned value is the SSR in milliseconds.
e.g.

```
sde1gwgse1-> cgsGetGwCpuId
value = 17 = 0x11
```

5.2.6 cgsGetCpuHealthCount

This function reports the local processor health count of a Gateway processor. The argument to this command is the Gateway CPU number. The Health Count is reported as an integer and is the return value of the command.
Note: This command does not report the Gateway's Master Health Counter.
e.g.

```
sde1gwgse1-> cgsGetCpuHealthCount 0
value = 26 = 0x1a
```

5.3 MISCELLANEOUS COMMAND LINE FUNCTIONS

5.3.1 cgsTrackFd

This function tracks a specific FD for as many passes as specified. The arguments to this function are the FDID of the FD to be tracked (in Hexadecimal), and the number of times to report the FD. This function is available only on the GCP.
e.g.

```
sde1gwgse1-> cgsTrackFd 0xb860,3
value = 47200 = 0xb860
sde1gwgse1->
110/14:12:43.212(tcgsCDQSvr)0- CHG DATA:  FDID: 0x0000b860   Status Type: 2   Reason
Code: 0x00000000
110/14:12:43.212(tcgsCDQSvr)0-            Data Word 0: 0x2e300000
110/14:12:43.220(tcgsCDQSvr)0- CHG DATA:  FDID: 0x0000b860   Status Type: 2   Reason
Code: 0x00000000
110/14:12:43.220(tcgsCDQSvr)0-            Data Word 0: 0x2e310000
110/14:12:43.230(tcgsCDQSvr)0- CHG DATA:  FDID: 0x0000b860   Status Type: 2   Reason
Code: 0x00000000
110/14:12:43.230(tcgsCDQSvr)0-            Data Word 0: 0x2e320000
```

6. GATEWAY STANDARD CONFIGURATION

There are two aspects to the Configuration of any Gateway: the setup of the boot parameters, and the setup of the GCP's NVRAM variables. This Standard configuration assumes that the Gateway Disk has been configured with the correct directory structure and that the VxWorks kernels for both the GCP and all FEPCs are resident in the "/sd0:/scid" directory.

6.1 GATEWAY BOOT PARAMETERS

The Boot parameters for any VxWorks board may be changed by typing "bootChange" at the "->" shell prompt, or by typing "c" at the "[VxWorks Boot]:" prompt. A download of the Gateway must be performed after the its initial boot. This will ensure that all of the required files are resident on the Gateway's Disk. The Boot parameters for all Gateways should be configured as follows:
Note: Text inside the <> is Gateway specific.

6.1.1 GCP Parameters

boot device:	scsi=0,0
processor number:	0
host name:	
file name:	/sd0:/scid/vxWorks.gcp
inet on ethernet:	<Gateway's Inet Addr>
inet on backplane:	<Should already be set>
host inet:	
gateway inet:	
user:	gwy
password:	<Gateway's password>
flags:	0x8
target name:	<Gateway's host name>
startup script:	/sd0:/scid/gcp.scr
other:	dc

6.1.2 FEPC Parameters

FEPC 1:

boot device:	sm=d8004100
processor number:	1
host name:	<Gateway's host name>
file name:	/sd0:/scid/vxWorks.fepc
inet on ethernet:	
inet on backplane:	<Should Already be set>
host inet:	<GCP's inet on backplane>
gateway inet:	<GCP's inet on backplane>
user:	target
password:	<Gateway's password>
flags:	0x8
target name:	<Gateway's target name>f01
startup script:	/sd0:/scid/<FEPC Startup script>

other:

FEPC X:

boot device:	sm=d8004100
processor number:	x
host name:	<Gateway's host name>
file name:	/sd0:/scid/vxWorks.fepc
inet on ethernet:	
inet on backplane:	<Should Already be set>
host inet:	<GCP's inet on backplane>
gateway inet:	<GCP's inet on backplane>
user:	target
password:	<Gateway's password>
flags:	0x8
target name:	<Gateway's target name>f0x
startup script:	/sd0:/scid/<FEPC Startup script>
other:	

6.2 GCP NVRAM CONFIGURATION

The GCP's NVRAM variables must be set for the Gateway to operate. The Standard Configuration for the NVRAM on a Gateway can be established by typing the following series of functions on the GCP.
Note: Text inside the <> is set specific.

gcpStandaloneDisable
cgs100BaseTEnable
cgsLogFileEnable
cgsSetPhysStreamNamePrefix "NULL"
cgsSetSysStreamNamePrefix "NULL"
cgsSetRtcnBcastAddr "<RTCN Broadcast Address in dot notation>"
cgsSetRtcnNetmask 0x< RTCN Netmask>
cgsSetFacility "<Facility>"